

WHAT IS CLAIMED IS:

1. In an apparatus for analyzing orbit and attitude data of a low-earth orbit satellite to establish a task schedule, and generating a satellite command, a low earth orbit satellite command planning apparatus
5 comprising:

a satellite event predictor for predicting various events related to the satellite;

a satellite task schedule planner for referring to the event to schedule a task schedule of the satellite, and establishing a satellite task
10 schedule;

a satellite telecommand planner for generating a set of telecommand data to be executed by the satellite according to the satellite task schedule established by the satellite task schedule planner; and

a mapping rule applier including a plurality of mapping rules applied
15 to the respective task schedules of the satellite.

2. The apparatus of claim 1, wherein the respective satellite tasks of the satellite task schedule established by the satellite task schedule planner include an ID, an execution time, and a parameter, and

the satellite telecommand planner compares the parameter
20 condition with mapping rules of the mapping rule applier, and automatically generates a set of satellite commands corresponding to the mapping rules matched with the condition.

3. The apparatus of claim 1, further comprising a first user interface for establishing the mapping rules, and wherein

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the first user interface comprises:

a list display for displaying a mapping rule list;

an information display for a mapping rule name, a task name to which the mapping rule is applied, and a relative time command sequence; and

a condition display for displaying a mapping condition according to a parameter of the task, and

the mapping condition includes a plurality of logical operation conditions and comparison conditions.

4. The apparatus of claim 3, wherein the logical operation conditions and comparison conditions include a logical product (AND), a logical sum (OR), an equal sign (=), a greater than sign (>), and a less than sign (<).

5. The apparatus of claim 3, further comprising a second user interface for defining the relative time command sequence and wherein

the second user interface comprises:

a list display for displaying a relative time command sequence list;

a command display for displaying a list of commands that can be added to a name of the relative time command sequence;

and

a command sequence display for displaying a set of commands included in the name of the relative time command sequence; and wherein

the second user interface selects the command included in the

command display and edits a command set sequence of the command sequence display.

6. A satellite command planning method for a satellite control system to generate a satellite command from a satellite task schedule,
5 comprising:

(a) comparing a satellite task included in a plurality of satellite task schedules with a predefined mapping rule when the satellite task schedules are input;

(b) generating a set of commands defined by a corresponding
10 mapping rule when the mapping rule corresponding to a condition of the satellite task is found after the comparison, and comparing a next satellite task with a next mapping rule when no mapping rule corresponding to the satellite task is found;

(c) generating a preliminary satellite command plan based on the
15 generated set of satellite commands; and

(d) inserting a satellite command indicator additionally needed for the satellite command, and generating a final command plan.

7. The method of claim 6, wherein a single mapping rule includes a plurality of sets of satellite commands in (b), and (b) comprises selecting a
20 single set of satellite commands corresponding to a parameter of the satellite task from among the sets of satellite commands.

8. In a control system for monitoring and controlling a low earth orbit satellite, a LEO (low earth orbit) satellite control system comprising:

an antenna for executing radio communication with the satellite;

a satellite operating system for receiving a telemetric signal of the satellite, processing and analyzing the signal, and transmitting a telecommand signal to the satellite through the antenna;

a task analysis and planning system for analyzing orbit and attitude
5 data of the satellite to establish a task schedule, and applying a plurality of mapping rules according to the established task schedule to generate a set of telecommand data; and

an interface for transmitting and receiving data between the systems.

9. The LEO satellite control system of claim 8, wherein the task
10 analysis and planning system comprises:

a satellite event predictor for predicting various events related to the satellite;

a satellite task schedule planner for referring to the event to
schedule a task schedule of the satellite, and establishing a satellite task
15 schedule;

a satellite telecommand planner for generating a set of telecommand data to be executed by the satellite according to the satellite task schedule established by the satellite task schedule planner; and

a mapping rule applier including a plurality of mapping rules applied
20 to the respective task schedules of the satellite.

10. The LEO satellite control system of claim 8, wherein the satellite operating system comprises:

a signal transmit/receive converter for receiving a telemetric signal of the satellite and transmitting a telecommand signal to the satellite through

the antenna;

a satellite telesurveillance unit for processing and analyzing the telemetric signal received from the satellite to monitor the states of the satellite; and

5 a satellite telecommand transmitter for transmitting a control command required for the satellite.